

CLAIMS

1. A display device comprising:

a light switching unit comprising an array of pixels each operable to vary the transmission of light therethrough; and

a backlight comprising a first series of linear regions of organic light-emissive material having a first emission colour and a second series of linear regions of organic light-emissive material having a second emission colour, each linear region of organic material being located so as to lie behind a plurality of pixels of the array in the viewing direction for backlighting those pixels; and

at least one of the linear regions of organic light-emissive material being formed by a process of ink-jet deposition.

2. A display device as claimed in claim 1, wherein each region of organic light-emissive material is formed by a process of ink-jet deposition.

3. A display device as claimed in claim 1 or 2, wherein the backlight comprises a third series of regions of organic light-emissive material having a third emission colour.

4. A display device as claimed in claim 3, wherein each region of organic light-emissive material having one emission colour is spaced from the next such region by at least regions of organic light-emissive material having both of the other emission colours.

5. A display device as claimed in any preceding claim, wherein each region of organic light-emissive material is formed by means of ink-jet deposition of material into a groove.

6. A display device as claimed in claim 5, wherein the groove is defined by regions of electrically insulating material.

7. A display device as claimed in any preceding claim, wherein the backlight comprises electrodes located on either side of the light-emissive material.
8. A display device as claimed in claim 7, wherein at least one of the electrodes is light transmissive.
9. A display device as claimed in claim 7 or 8 as dependant on claim 6, wherein parts of at least one of the electrodes overlap parts of the insulating material and lie in front of those parts of the insulating material in the viewing direction.
10. A display device as claimed in any of claims 7 to 11, comprising conductive material located in contact with an electrode to lower the resistance across that electrode.
11. A display device as claimed in claim 10, wherein the said conductive material comprises a metal or an alloy.
12. A display device as claimed in claim 10 or 11 as dependant on claim 5, wherein the said regions of conductive material at least partially overlap the insulating material.
13. A display device as claimed in any of claims 7 to 12, wherein at least one of the electrodes is patterned to permit independent control of each series of light-emissive regions.
14. A display device as claimed in claim 13, wherein only one of the electrodes is patterned to permit independent control of each series of light-emissive regions and the other electrode is common to all the light-emissive regions.
15. A display device as claimed in any preceding claim, comprising a structure for receiving and spatially and/or spectrally narrowing the light emission from at least one of the regions of light-emissive material.

16. A display device as claimed in claim 15, wherein the structure is an interference, cavity and/or microcavity structure that comprises a region of light-emissive material.

17. A display device as claimed in any preceding claim, comprising an optical colour filter arranged for receiving and filtering light emitted from at least one of the regions of light-emissive material.

18. A display device as claimed in any preceding claim, wherein the light switching unit is a liquid crystal unit.

19. A display device as claimed in any preceding claim, wherein the array of pixels is an orthogonal array.

20. A display device as claimed in any preceding claim, wherein each region of organic light-emissive material is formed by means of ink-jet deposition of a solution of the organic light-emissive material.

21. A display device as claimed in any preceding claim, wherein the organic material is a polymer.

22. A display device as claimed in any preceding claim, wherein the organic material is precursor material.

23. A display device as claimed in any preceding claim, comprising a display control unit coupled to the light switching unit and the backlight and operable to address synchronously each region of organic material together with the pixels of behind which that region lies.

24. A display device comprising:

a light switching unit comprising an array of pixels each operable to vary the transmission of light therethrough; and

a backlight comprising a first series of linear regions of organic light-emissive material having a first emission colour and a second series of linear regions of organic light-emissive material having a second emission colour, each linear region of organic material being located so as to lie behind a plurality of pixels of the array in the viewing direction for backlighting those pixels; and

at least one of the linear regions of organic light-emissive material being formed by a selective deposition process.

25. A method for forming a light-emissive unit of a display device, the display device having a light switching unit comprising an array of pixels each operable to vary the transmission of light therethrough, the method comprising the steps of:

forming a series of grooves on a substrate;

depositing by means of ink-jetting in some of the grooves a first linear region of organic light-emissive material having a first emission colour;

depositing by means of ink-jetting in others of the grooves a second linear region of organic light-emissive material having a second emission colour; and

locating the grooves such that the light-emissive material in each groove lies behind a respective plurality of pixels of the array in the viewing direction for backlighting those pixels.

26. A display device substantially as herein described with reference to the accompanying drawings.

27. A method for manufacturing a display device, substantially as herein described with reference to the accompanying drawings.

11 08.01.00
22
2015